

# 7.2 & 7.3 Solving Addition & Subtraction Equations

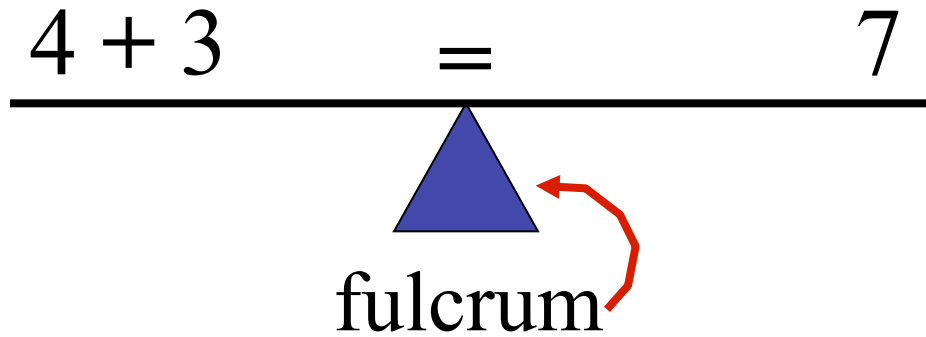
*Objective: To solve one-step equations*




# Addition Equations

Equation - a balanced statement of equality between two quantities.

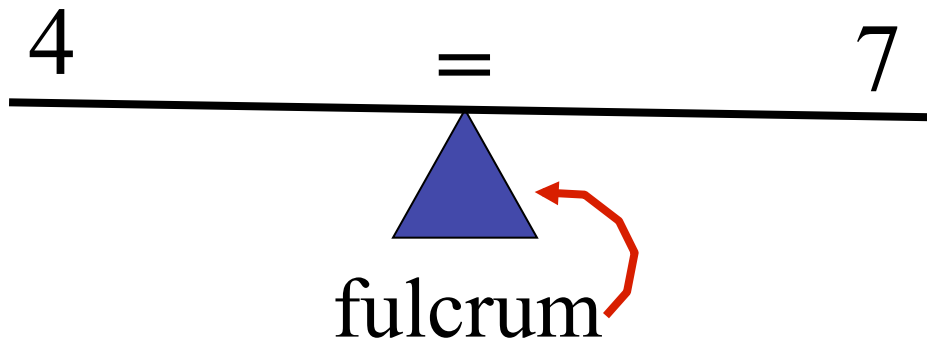
$$4 + 3 = 7$$

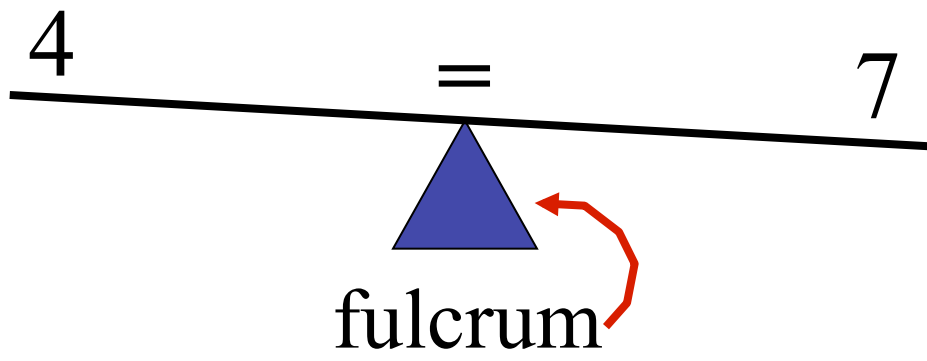


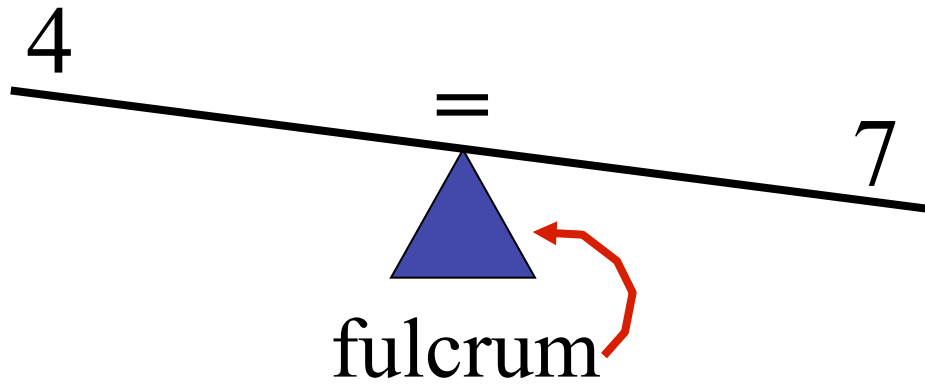

$$\begin{array}{r} 4 + 3 \\ \hline - 3 \end{array} = 7$$


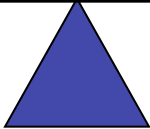
fulcrum


The diagram illustrates the concept of a fulcrum in a mathematical context. A horizontal line represents the fulcrum, with a blue triangle underneath it. The word "fulcrum" is written below the triangle. A red arrow points from the right side of the fulcrum towards the left side, indicating a shift or movement. The equation  $4 + 3 = 7$  is shown above the fulcrum, with a red diagonal line striking through the  $4 + 3$  part, suggesting a transformation or simplification of the expression.








$$\begin{array}{r} 4 + 3 \\ - 3 \\ \hline \end{array} = \begin{array}{r} 7 \\ - 3 \\ \hline \end{array}$$



$$\begin{array}{c} 4 \qquad = \qquad 4 \\ \hline \triangle \end{array}$$

Perform the same operation to both sides  
to keep the equation balanced.



Use the same property to solve equations.

$$\begin{array}{r} x + 6 = 11 \\ \hline -6 \quad \triangle \quad -6 \end{array}$$

$$\begin{array}{r} x = 5 \\ \hline \triangle \end{array}$$

### Algebraic Approach

$$\begin{array}{r} x + 6 = 11 \\ -6 \quad -6 \\ \hline x = 5 \end{array}$$

# Rules for Transforming Equations

- Goal: Isolate the variable on one side of the equation
- Always perform the same operation to both sides of the equation
- To undo an operation, perform its opposite operation



## Solve the equation. Is your answer reasonable?

$$\begin{array}{r} 1) \ x + 3 = 12 \\ \quad - 3 \quad - 3 \\ \hline \quad \quad \quad x = 9 \end{array}$$

$$\begin{array}{r} 2) \ z + 13 = 29 \\ \quad - 13 \quad - 13 \\ \hline \quad \quad \quad z = 16 \end{array}$$

$$\begin{array}{r} 3) \ 4 + y = 11 \\ \quad - 4 \quad \quad - 4 \\ \hline \quad \quad \quad y = 7 \end{array}$$

$$\begin{array}{r} 4) \ -10 = 22 + p \\ \quad -22 \quad -22 \\ \hline \quad -32 = p \end{array}$$

$$\begin{array}{r} 5) \ 43 + x = 13 \\ \quad - 43 \quad \quad - 43 \\ \hline \quad \quad \quad x = -30 \end{array}$$

$$\begin{array}{r} 6) \ c + 2.7 = 11.4 \\ \quad - 2.7 \quad - 2.7 \\ \hline \quad \quad \quad c = 8.7 \end{array}$$

$$\begin{array}{r} 7) \ x - 3 = 12 \\ \quad + 3 \quad + 3 \\ \hline \quad \quad x = 15 \end{array}$$

$$\begin{array}{r} 8) \ z - 13 = 29 \\ \quad + 13 \quad + 13 \\ \hline \quad \quad z = 42 \end{array}$$

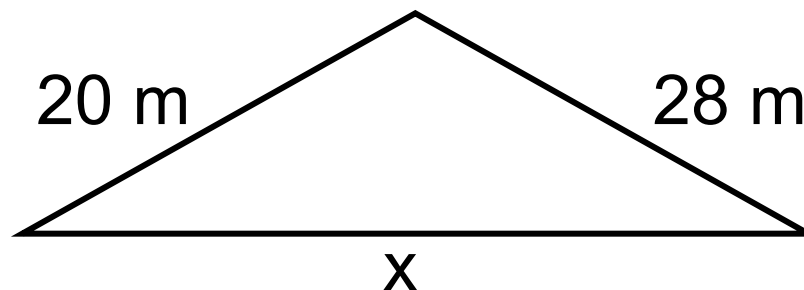
$$\begin{array}{r} 9) \ \frac{1}{2} = q - \frac{1}{4} \\ \quad + \frac{1}{4} \quad \quad + \frac{1}{4} \\ \hline \quad \quad \frac{3}{4} = q \end{array}$$

$$\begin{array}{r} 10) \ 10.5 = n - 2.4 \\ \quad + 2.4 \quad \quad + 2.4 \\ \hline \quad \quad 12.9 = n \end{array}$$

$$\begin{array}{r} 11) \ 4.7 + y = 8.4 \\ \quad - 4.7 \quad \quad - 4.7 \\ \hline \quad \quad y = 3.7 \end{array}$$

$$\begin{array}{r} 12) \ x - \frac{1}{4} = \frac{3}{4} \\ \quad + \frac{1}{4} \quad + \frac{1}{4} \\ \hline \quad \quad x = 1 \end{array}$$

13) The perimeter of the triangle shown is 90 m.



Write an equation that can be used to determine the length of side  $x$ .

$$90 = 20 + 28 + x$$

Calculate the length of side  $x$ .

$$90 = 20 + 28 + x$$

$$90 = 48 + x$$

$$\begin{array}{r} -48 \quad -48 \\ \hline \end{array}$$

$$42 = x$$